INJURY PREVENTION FOR RUNNERS

1) WHY DO RUNNER’S GET INJURED?
   - TOO MUCH TOO SOON!
   - Overtraining.
   - Not allowing for proper recovery.
   - Not listening to your body.
   - Strength and flexibility imbalances.
   - Weakness.
   - Inflexibility.
   - Improper or over worn shoes.
   - Poor running surface. (sloped shoulder on road or beach, or always running on pavement.)

2) HOW DO YOU PREVENT INJURIES?
   - Follow a sensible training program which incorporates appropriate rest.
   - Listen to your body.
   - Warm up muscles before running more intensely.
   - Strengthen muscles specific to running.
   - Stretch thoroughly after running.
   - Apply cold water and ice when appropriate or necessary.
   - Massage (self massage and professional massage).

3) HOW DO YOU KNOW IF YOU ARE ALLOWING FOR PROPER RECOVERY?
   A sensible training program, which, IF FOLLOWED, should get you to the starting line in shape and injury free. However, even with the most sophisticated training programs, failing to allow recovery is a common error. Be alert to mood changes, increased morning heart rate, increased restlessness and disturbed sleep. Consider reducing the mileage or intensity of your workouts or both, particularly if you notice more than one of these symptoms occurring simultaneously.

4) WHAT DO STRENGTHENING AND STRETCHING ACCOMPLISH?
   Stretching and strengthening exercises help to correct imbalances which can develop among different muscle groups. If these imbalances are allowed to persist they will place undue stress on particular areas of the body which may ultimately result in an injury. For example, weak and inhibited gluteal muscles can lead to an IT Band injury. Weak shin muscles combined with tight calf muscles often times can lead to shin splints or a stress fracture. Many injuries are due to weakness on "one" side of a joint. If that weak muscle is fighting a tight muscle on the opposite side, fatigue sets in more quickly. This leads to poor biomechanics which compromises joint integrity, often times resulting in an injury. Muscle tightness can result in poor posture, contributing to neck, back and shou
5) WHAT ARE APPROPRIATE STRENGTHENING EXERCISES AND WHEN SHOULD THEY BE DONE?
Exercises to strengthen crucial muscles are a great way to reduce the muscular imbalances mentioned above. The Strength Exercises section of this packet describes and explains some of the more important strengthening exercises. Each of these exercises aims to strengthen muscles which commonly present problems in runner's. The exercises should ideally be performed 2 to 3 times a week, with 2 to 3 sets of 15 to 20 repetitions per exercise. When starting these exercises, gradually build the number of sets, repetitions and resistance. Remember that strengthening is reserved for healthy muscles. If you are experiencing pain or functional problems you may need to go through a rehabilitative process, which may include rest and/or treatment of the injured tissue followed by movement and stretching, before the strengthening should be started.

6) WHAT ARE THE APPROPRIATE STRETCHES AND WHEN SHOULD THEY BE DONE?
Lighter stretches or stretching movements, without bouncing, should be incorporated as part of your warm up before each run. Deeper stretches should be done after exercise while you are still warm and the muscles are more pliable. Specific stretching and use of a roller for self massage, as shown in the Stretching and Self Massage section can significantly improve flexibility, reduce post exercise soreness, reduce the amount of time it takes your body to recover from a particular training session and, best of all, help to avoid injury. Stretching may be uncomfortable, but it should never be painful or sharp. Do not force the stretch, wait for the tissue to relax. It usually takes from 15 to 60 seconds to achieve an effective, deep stretch. Stretch every day whether you run or not; you may tighten up more on an off day, particularly if you have a sedentary desk job. Stretch deeper and with more intensity after exercise while you are still warm. You can also perform deeper stretching at another time but you need to warm up your muscles first; never stretch intensely when muscles are cold.

7) HOW DOES ONE USE THE FOAM ROLLER?
The roller should be used prior to stretching a muscle. It is a very effective method of applying self massage. The best approach is to roll to a tight place on the muscle and then wait until you feel some softening take place. Don't hold on one spot for more than a minute. You need to relax for self massage to be effective. If you take the time to become skilled with the roller, you will be surprised at the improvements in your stretching and your flexibility.

8) WHAT ARE THE BENEFITS OF COLD WATER AND ICE AND WHEN DO YOU USE THEM?
Cold water and ice are an athlete's best friends! They are the cheapest doctors in the world and often times more effective. A 10 to 15 minute soak in cold water between 55 and 60 degrees helps prevent post exercise muscle soreness and inflammation. Ice should be used on any acute injury, such as a sprained ankle or pulled muscle, as soon as possible - in minutes if its available. Application of ice is most effective in the first 24 to 48 hours following an injury. By timely icing, you can dramatically reduce the severity of an injury. It is also valuable for treating chronic inflammations, such as Achilles tendonitis, plantar fasciitis, shin splints and other tendon injuries. Ice can be used in the form of an ice cup by continuously applying the ice with movement over a treatment area. Treatments should last from 10 to 20 minutes depending on the size of the area. For example, 10 minutes on an Achilles tendon and 20 minutes on a strained hamstring belly. Icing should not be repeated until the treatment area returns to normal body temperature, generally 30 to 40 minutes. Be careful when using reusable gel packs with plastic rather than cloth covers. They can be too cold and easily cause frostbite. Put a thin cloth between your skin and the pack.
9) How do you select appropriate shoes and how many miles can one expect from them.

The best way to select an appropriate running shoe is to visit a local specialty running shoe store and try on many different models of shoes. The sales person can help you find the appropriate kind of shoe based on your foot type, and whether or not you pronate or supinate excessively. In general, a motion control shoe is best for over pronators with flat, floppy feet, and a shoe with extra cushioning is best for those with a rigid, high arched foot. Once you find a pair of shoes which seem to work, you need to continuously monitor how worn the shoes become. Many running injuries can be due to training in shoes which have broken down and no longer provide sufficient support and/or cushioning. In general, you should not run in a particular pair of shoes for more than 400-500 miles.

10) Can deep tissue massage improve performance and reduce injury?

Both self-massage and professional massage, should be an integral part of every athlete's training. We approach massage from three different perspectives: performance enhancement, injury prevention and injury rehabilitation.

Performance Enhancement: Tight muscles do not get normal circulation and can become inhibited and irritated. Inflexibility associated with tightness can cause holding patterns and/or lack of strength which prevent relaxed, efficient training and performance. By comparison, relaxed muscles get better circulation, test stronger and tolerate training at a higher intensity with less pain and breakdown. Deep tissue massage reduces restrictive and sometimes painful muscle contractions and trigger points. With regular treatments, many athletes are able to change old holding patterns, allowing them to improve strength, speed and endurance.

Injury Prevention: Tightness can be a setup for muscle strain and other soft tissue injury. If tight and shortened muscle tissue is over stretched during activity, strain can occur even if the activity was no different from the previous day. In addition, chronic tightness can cause muscle and connective tissue injury and inflammation, resulting in back and shoulder pain, tennis elbow, iliotibial band syndrome, shin splints, Achilles tendonitis and plantar fasciitis. An experienced therapist can feel tightness and focus massage and stretching in those areas, helping to prevent the onset of injury.

Injury Rehabilitation: When added to medical treatment and physical therapy, deep tissue work provides a faster and more complete recovery. Mild strains, not involving torn muscle fibers, can usually be eliminated with a few sessions of deep tissue massage. More serious strains do involve torn muscle fibers. Scar tissue develops as the muscle heals which often causes pain when the muscle contracts and limits range of motion. After healing, scar tissue can be broken down by deep longitudinal strokes accompanied by joint movement and followed by assisted stretching. Chronic tendonitis is associated with scar tissue and adhesions in tendons and may be resolved by 6 to 12 sessions of deep cross-fiber friction massage.

Most of the injuries runner's experience are overuse injuries which result in muscle strain and tightness. These types of injuries respond readily to expert deep tissue therapy. Self-massage using a foam roller is a great way to get some of the benefits of professional massage and to monitor muscle tightness and sensitivity.
The Foot Drills for SHIN SPLINTS and other lower leg and foot injuries

By Russ Ebbets, DC

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Over the last decade I have had the good fortune to lecture on track and field and distance running throughout America and the world. The topic of the day could be sports psychology, training theory or biomechanics, but I always try to slip in a comment on the importance of the six foot drills. In many instances, it may seem totally unrelated, but if performance is one’s ultimate goal, and if only one thing is remembered from the day’s lecture – I hope it is the six foot drills.

I go the idea for the foot drills from my study in East Germany in 1987. Quite honestly there was little value to that study tour. The East Germans seemed confused by our questions and their presentations were disjointed and generally pointless. They did show us one Super 8 film on foot drills for high jumpers. It didn’t register at the time.

I’ve subsequently studied several people’s work, including Edgar Cayce, who have discussed the benefits and virtues of doing daily foot exercises for prevention of a multitude of foot and leg problems. In 1987 the six foot drills were integrated into my team’s daily training plan and the grand experiment began.

We did the six drills at the start of each practice. Five of the six drills are done barefooted or in stocking feet. The distance covered for each drill is about 25 meters. Each drill is done once daily. The walking is done at one’s own pace. Total time for the drill with shoes off to shoes on is about four minutes. Pretty simple.

The six drills, illustrated below, are simply to walk on the outside of the foot (invert the foot), walk on the inside of the foot (evert the foot), walk with a toe-in, or pigeon-toed gain (adduct the foot), walk with the toes pointing out (a la Charlie Chaplin), and with the shoes back on, walk on the heels – this protects against bruising the heel.
Done daily these six drills will eliminate shin splints, Achilles’ tendonitis, plantar fasciitis, lessen the chance of a severe ankle sprain and virtually all knee problems. The famous Rice Study done in the early 90s found that 79% of running injuries are from the knee down. One of the reasons I had successful teams is that my athletes made it to the competition day healthy and ready to compete. Season after season was completed with virtually no injuries.

It should be noted that there are three problems with the foot drills; they are simple, they are easy, and they are free. It doesn’t involve more than taking off one’s shoes and putting one foot in front of the other. But that is easier said than done.

Why do the foot drills work? There is very little muscle in the foot. This presents a problem because most of the balance and proprioceptive sense we get comes from our muscles. A second point is that the neuromuscular pathway (the communication line) from the brain to the foot is the longest and slowest in the body. This leads to bad, or at best, poor coordination of the foot. If you doubt that, put a pen between your toes and try to write your name.

The demands of athletic participation - be it running, jumping or quick starts and stops - places tremendous stresses on the foot. In fact, the foot must sustain seven times the body’s weight with simple running, and up to 20 times body weight in some jumping activities. Done repeatedly, this is how an overuse syndrome such as shin splints, plantar fasciitis or Achilles’ tendonitis develops.

By challenging the foot with various gaits, one develops a clearer pathway from the foot to the brain. Clearer pathways are faster and more responsible. This gives one better balance and proprioception. Each foot strike becomes more “sure,” the foot contacts the ground without a wobble, however slight that wobble might be. It is because of the “sure foot stride” that the overuse syndrome (Achilles’ tendonitis, plantar fasciitis or shin splints) are eliminated.

It has been said that running is a ground contact sport. It is this repeated micro trauma of ground strike, repeated thousands of times than can lead to injury. Other factors, such as running surfaces and proper shoe selection, can influence the incidence of injury. But I will contend with a great deal of assurance that the six foot drills, done consistently, will have a tremendous positive benefit on one’s athletic participation and performance. Applying the simple, easy and free.

The last note. The foot drills will also make you faster. I mentioned the slight “wobble” of each foot strike. More accurately described, a “wobble” is lateral, side-to-side motion. Speed is generally straight ahead. If, on each foot strike there is the wobble or lateral motion before there is the forward motion, there is lost time – not much, but some. If one’s ground contact time can be reduced 1/100th of a second (it takes 14/100ths to blink an eye,) the cumulative effect can drastically improve one’s performance.

Consider this – if one takes 50 steps in the 100m, 50 x 1/100 = 50/100 seconds, or ½ a second. One-half second is the difference between the 9th place spectator and the Olympic Gold Medallist. In a mile, this reduced ground contact time translates to an 8-10 second difference and in the 10K it means between 50-60 seconds. An improvement made in the blink of an eye, one step at a time. Simple, easy and free.
Patellofemoral Knee Pain

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General

Patellofemoral syndrome describes a variety of injuries affecting the patella (kneecap) and its groove on the thigh bone. The patella moves up and down in its groove when the knee is extended (straight) or flexed (bent). If repetitive forces acting on the patella during this up-and-down motion are unbalanced, such as with running and jumping, or if the patella moves side-to-side too much, painful symptoms may develop.

Patellofemoral syndrome is the most common knee injury in athletes and physically active adults. Typically, women—especially adolescent females—experience more patellofemoral problems than men. Runner’s knee, biker’s knee, patellofemoral pain syndrome, patellofemoral stress syndrome, patellalgia and chondromalacia patella are just a few of the common terms used to identify this syndrome.

The exact cause of pain is not known. The cartilage that lines the under surface of the kneecap has no nerve endings so pain likely does not originate here. Some experts feel the pain is a result of wear on the bone underlying the cartilage or possibly, breakdown products of injured cartilage.

Symptoms

The injury is usually a result of repetitive running and jumping activity rather than a single traumatic event. Symptoms usually develop gradually with initial pain resembling a dull knee stiffness or ache present early in activity. As you warm up, the stiffness/pain may improve or disappear. Hours after the workout, symptoms may reappear. As the injury progresses, pain may be present throughout activity. Symptoms may worsen when descending steps or hills. Squatting and kneeling may also aggravate the symptoms. Crepitus (a “crunching” sound under the kneecap with movement of the knee) may also be present. When you sit for an extended time, resuming activity may result in pain and stiffness until the muscles “loosen up.” Those with advanced cases may experience “giving way” in the knee when walking or running.

Diagnosis is dependent on a history of symptoms and pain during specific physical exams. There is no single test that confirms patellofemoral syndrome. In fact, some athletes with this injury may have a completely normal exam. Although, X-rays or other medical imaging techniques of the kneecap joint may be helpful.

Treatment

About 80 percent of all patellofemoral problems can be treated without surgery. Treatment is directed at correcting muscle imbalance, weakness or alignment problems of the lower back, pelvis, hip or lower extremity. Almost all studies of patellofemoral syndrome indicate weakness in the quadriceps (the muscles in the front of the thigh). Appropriate flexibility exercises may also be used. Strengthening hip and abdominal muscles could correct abnormal alignment of the low back, hip and pelvis and relieve patellofemoral strain. Those who pronate excessively (have flat feet) are thought to be at increased risk for patellofemoral injuries. So, treatment may also include orthotics to correct overpronation.
Braces and taping are commonly used to relieve symptoms. They are effective in reducing pain severity, but do not cure the problem. Ice therapy after exercise may relieve symptoms effectively. Non-steroidal anti-inflammatory drugs (NSAIDs) and acetaminophen reduce pain from this injury. Neither medication is a cure.

**Exercises to strengthen the quadriceps and hamstring muscles**

**Step-Overs (quadriceps)**

Stand on a step or stack of several phone books. With weight on the injured leg, step slowly off the step with the uninjured leg. Touch the heel to the step or ground with no weight on the heel. Recover to the starting position. (See example).

Do this exercise for 30–60 seconds for one set. Perform 3 sets.

**Prone leg lifts (hamstrings)**

Lay face down on the floor. With the knee straight, slowly lift one leg off the floor and hold for a count of five (exercise 1). Lower the leg and perform a similar maneuver with the other leg. Do 3 sets of 20–30 repetitions with each leg.

Next, bend the knee and lift the leg off the floor holding the position for a count of five (exercise 2). Lower the leg and do the same exercise with the other leg. Do 3 sets of 20–30 repetitions.

The Gatorade Sports Science Institute (GSSI) serves to share current information and expand knowledge on sports nutrition and exercise science to enhance the performance and well-being of athletes. For more information, check out the GSSI web site at www.gssiweb.com.

This information is for educational purposes only and is not meant to replace medical or treatment advice given by your physician.
Overuse Knee Injuries

These injuries are characterized by pain felt around the front or sides of the knee joint. Typically, the knee slowly begins to hurt, but the pain is not related to a specific injury such as twisting or falling.

There are several types of overuse knee injuries:

- Anterior knee pain (also known as patellofemoral joint pain)
- Patellar tendinitis (jumper's knee)
- Iliotibial band syndrome (runner's knee)
- Quadriceps tendinitis
- Bursitis

WHERE'S YOUR PAIN?

Possible Causes and Exercises

Outside of Knee
Iliotibial Band Pain

Exercises:
1. Hip Squat
2. Clam
3. Figure Four Stretch
4. Crossover Stretch
5. Hamstring Stretch
6. Calf Stretch

Around Knee Cap
Anterior Knee Pain

Exercises:
1. One Leg Squat or Hip Squat
2. Mini Squat or Leg Press
3. Clam
4. Hamstring Stretch
5. Calf Stretch
6. Stork Stretch
7. Kneeling Stretch

Above Knee Cap
Quad Tendinitis

Exercises:
1. Stork Stretch
2. Hamstring Stretch
3. Calf Stretch
4. Kneeling Stretch

Below Knee Cap
Patellar Tendinitis

Exercises:
1. Stork Stretch
2. Hamstring Stretch
3. Calf Stretch

On Top of Knee Cap or Inside of Upper Shin
Bursitis

Exercises:
1. Stork Stretch
2. Hamstring Stretch
3. Butterfly Stretch
4. Calf Stretch

WHAT TO DO

Rest - from all activities that cause pain, especially running, jumping and going up and down stairs.

Ice - two to three times per day. Place crushed ice in a plastic bag, over the knee for 20 minutes.

Aspirin or Ibuprofen - (Important: Stop taking if it causes stomach upset or bloody stools.) To reduce inflammation (for patellar tendinitis, quad tendinitis, or IT Band Syndrome): follow the directions on the bottle of aspirin or ibuprofen. Contact your physician if you are currently taking other medications or if you have any questions.

Strengthen - Muscle strength imbalances of the thigh or hip are possible causes of anterior knee pain and iliotibial band pain.

*Strengthening restores muscle balance.*
Mini Squat
- Rest your back on a wall with your feet 18-24” in front of you.
- Slowly bend your knees to ≤ 90° (pain-free range only).
- **Do not bend your knees forward past your feet.**
- Hold for 2 counts, then slowly straighten your knees.
- To work the inner thigh, do the squat while squeezing a ball or pillow between your knees.
- When this feels easy, hold weights.

Leg Press
- Adjust the platform so your knee bends ≤ 90°.
- Place your foot on the platform.
- Pushing through the ball of your foot, straighten your knee, then slowly bend it.
- Don’t completely straighten the knee. Keep your foot flat on the platform.

One Leg Squat
- Stand with your injured leg on a step.
- Slowly bend your knee until the heel of your other foot touches the ground.
- Then slowly straighten your knee.
- When this feels easy, hold weights.

Clam (outer hip)
- Lie on your side with hips bent forward 45° with your feet together and your knees bent approximately 90°.
- Slowly rotate your top kneecap up towards the ceiling until your knees are approximately one hand-width apart.
- Hold for 3 counts, then slowly lower your knee.
- Do not lean your hips back or lift up your top foot.

Hip Squat (gluteal)
- Stand with your un-injured side against a wall.
- Squeeze your buttocks together and hold.
- Keep squeezing your buttocks through the entire set.
- Slowly bend your injured knee approximately 45°.
- Hold for 1 count, then slowly straighten your knee.

Stretch:
- Tight thigh, hip and calf muscles are possible causes of overuse knee injuries.

Technique:
- Unless otherwise indicated, hold for 20-30 seconds at a point of a gentle stretch without bouncing.

Frequency:
- Do 2-3 sets per day, 6-7 days per week.

**Stretching exercises help loosen tight muscles.**

Calf Stretch
- Stand with your feet pointed forward.
- Keep your heels down and back leg straight.
- Slowly bend the front knee until you feel an upper calf stretch in the back leg.

Kneeling (front hip)
- Kneel on the leg that you're going to stretch.
- Squeeze your buttocks together and shift your hips slightly forward until you feel a stretch along the front of your hip/thigh.
- Don't lean forward or twist your hips.
Hamstring Stretch

- Lie on your back with one leg straight and the other flexed up 90° at the hip.
- Slowly straighten your knee until you feel a stretch along the back of your thigh.
- Hold for 5 seconds then slowly lower your leg. Do 10-15 repetitions.

Hamstring Stretch (back thigh)

- Sit with one leg straight and the other bent to the side.
- Slowly lean forward with your chest until you feel a stretch along the back of your thigh.
- Do not reach forward with your hands.

Stork (front thigh)

- Stand with back straight and knee bent.
- Place a foot on a table or chair, keeping your thigh pointed straight down.
- Squeeze your buttocks together and shift your hips forward slightly until you feel a stretch along the front of your thigh.
- Do not lean forward or twist your hips.

CALL YOUR DOCTOR IF

- Knee pain continues after two weeks of self-care.
- You feel sharp, shooting pain at rest (sitting and sleeping).
- You can't walk without limping.
- You see or feel a deformity (possible fracture).
- You feel unusual numbness or tingling in your knee, lower leg or foot (possible circulation problems).
- Your lower leg, foot or toes are blue and cold (possible circulation problems).
- Your lower leg, foot or toes are red and hot and you have a fever (possible infection).

Prevention

Most overuse knee injuries can be prevented by using these guidelines:

Condition before starting an activity

To prevent injury, it's important to develop strength and flexibility in the muscles that are primarily involved in your chosen sport. Begin conditioning exercises at least 4-6 weeks before starting a sport season or a strenuous exercise program.

Start any new sport season or exercise regimen at a low intensity

For sports, play no longer than one hour and slowly increase your playing time and intensity each week. For fitness activities such as running, biking, swimming and strength training, start off at a short duration and low intensity, and increase the duration and intensity by no more than 10% a week.
Achilles Tendonitis, Plantar Fasciitis, and Shin Splints

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Introduction

You aren’t alone! Achilles Tendonitis, Plantar Fasciitis, and Shin Splints are three of the most typical overuse injuries in sports. These conditions have a lot of things in common and affect many athletes in running and jumping sports.

1. Achilles tendonitis is an inflammation of the tendon that connects your calf muscles (gastrocnemius and soleus) to the back of the heel (calcaneus). Pain typically occurs about two centimeters above the site of insertion into the heel.

2. Plantar fasciitis causes pain on the bottom of the foot at the insertion of this membrane into the inner side of the heel. You may feel pain on the first step after getting out of bed with this problem. The plantar fascia connects your toes and forefoot to the heel and supports the arch.

3. Shin splints is a general term for pain in the muscles and areas along the surface of the shin.

Overtraining

One common feature of these conditions is that they often result from overtraining. As a general rule athletes who increase their training stress by more than 10% weekly run a 50% risk of injury in four weeks.

1. Achilles tendonitis occurs in any level athlete who may have increased speed workouts, hill running, jumping or total training volume. Achilles/calf is the major muscle tendon group responsible for the push-off that leads to the airborne or “leaping” phase of running.

2. Plantar fasciitis can affect anyone but is more common in older athletes, overweight athletes or those engaged in prolonged exercise. Distance runners who run high mileage; tennis players spending hours on the court on their toes; and basketball athletes in the midst of two-a-day preseason training are examples of athletes who frequently develop plantar fasciitis.

3. Shin splints on the other hand typically affect beginners and underconditioned athletes who dramatically increase their running at the beginning of the season or at the start of more intense training. If you are a more experienced and well conditioned athlete, shin pain could arise from other causes besides typical shin splints, such as tibial stress fractures or compartment syndromes.
Treatment Principles

Because these injuries relate to overtraining the first principle of treatment is rest.

1. If you have mild symptoms, begin by reducing training by 50% and then gradually reinstate training volume by 10% per week as treatment continues.

2. If you cannot run without a limp, you may have a moderate to severe case, which requires complete rest. After a few weeks of rest, begin a gradual return with aerobic training that substitutes for the motions used in your sport.

3. In severe cases, you may be kept out of your sport until clinical improvement is noted by your physician.

The second principle of treatment is the reduction of inflammation. Icing helps reduce swelling and inflammatory change and is the treatment of choice:

1. For Achilles injuries, use an ice massage with water frozen in a styrofoam cup.

2. For Plantar fasciitis, submerge the heel for 10 minutes in an ice bath.

3. For Shin splints, a good strategy may be to use an iced whirlpool.

Non-steroidal anti-inflammatory medications (NSAIDS) help these treatments. You may not need to continue taking NSAIDS after 5 to 7 days, except to relieve pain. After this time most of the changes in these conditions have more to do with tissue breakdown than inflammation.

Rehabilitation

Specific rehabilitation exercises help restore the strength of supporting muscle groups and allow you to return to full activity. These exercises emphasize strengthening the muscles that support the foot, arch and lower leg. In general, exercise needs to work on both concentric (contracting) and eccentric (lengthening) strength.

1. For the Achilles, conduct heel raises on a step by slowly lowering the heels below the level of the step on the downward phase. This provides both concentric and eccentric stress. You may start by lifting body weight on one foot, then add progressive weights to a backpack to gradually increase strength. Simple toe raises, heel raises, walking on heels and toes and walking backwards while carrying steadily increased weight are part of a functional rehabilitation program. This program will strengthen the muscles that support the shin and the arch.

2. The above exercises can also benefit shin splints and plantar fasciitis.

3. In addition, toe curls and arch curls may help plantar fasciitis.

Stretching should be done cautiously while any tissues are inflamed. Stretches should be directed at motion deficits. For example, if you have poor dorsiflexion (little flexibility upward) of the foot, you may be prone to Achilles injuries unless you perform calf stretches to gradually improve this. At the same time a tight anterior tibialis (shin bone) may limit good plantar flexion (needed to stand on your toes) and affect running form. In general performing two to three pain-free stretches lasting 30 seconds for affected muscle groups is a good starting point.

Returning to sport from an overuse injury means you have rehabilitated enough to perform without compromising good form. Athletes who limp, change running or jumping form or favor one leg, will ultimately get another injury and lose additional time. While you may not be 100% pain free, the ongoing training and competition should not prevent daily progress toward recovery. After training resumes, some specific exercises and post activity icing may be needed for a few weeks or months.
Iliotibial Band Syndrome (ITB)

Pain on the outside of your knee (not usually accompanied by swelling or locking). The pain may be sporadic and disappear with rest, only to reoccur suddenly, often at the same point in a run. Depending on the individual, this could happen at four miles, two miles or just 200 yards. The pain often goes away almost immediately after you stop running.

This is an overuse injury. The iliotibial band is a band of tissue that begins at the outside of the pelvis and extends to the outside part of the knee. The band helps stabilize the knee. If it becomes too short, the band rubs too tightly on the bone of your leg and becomes irritated. The tightness is usually the result of too much strain from overtraining.

To get over ITB syndrome, patience is required. This one takes a while. Give yourself plenty of rest, reduce your miles and ice frequently. You can keep running, but cut your run short as soon as you begin to feel any pain. Cut way back on hill work, and be sure to run on even surfaces. Look into some deep friction massage with a physical therapist.

The photos that follow depict a number of effective stretches and exercises that can help runners beat this common injury. All photos below assume that it is the right leg that is the injured leg. Repeat all stretches 3-5 times, 3 different times a day. With all these stretches you may feel it more up near the hip as opposed to down lower where you may be experiencing pain; this is normal.

**Stretch #1:** Pull foot up to back of buttocks. Cross the uninjured leg over the injured leg and push down, hold for 30 seconds.

**Stretch #2:** Cross injured leg behind and lean towards the uninjured side. This stretch is best performed with arms over the head, creating a "bow" from ankle to hand on the injured side (unlike how it is depicted).

**Stretch #3:** Cross injured leg over the uninjured side and pull the leg as close to your chest as possible.

**Foam Roller:** Roll your injured leg over the foam roller, add more time gradually each day to help mobilize your tissues and break up scar tissue.

**Balance on 1 Leg Strengthening (left right):** May start just balancing on one foot when brushing your teeth. Gradually you can add challenges such as using a soccer ball and moving the ball in different directions is depicted.

**Side Leg Lifts:** Keep the back of the leg and buttocks against the wall. Slide the leg up the wall and hold at the top. Start with one set of 20 each leg, after 1 week add a second set of 5. Every 2 days add 5 more as long as it is being well tolerated until you build up to 3 sets of 20 lifts.

**Strengthening with Theraband (left and right):** Loop one end and close in the door. Loop other end around the uninjured leg. Bend your knee on the injured leg and balance on the injured leg. Put your uninjured leg through a range of running motion, going up and back. Build up to 3-5 minutes, make sure to exercise both legs.